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[FAD 20: Agriculture and Food Processing Equipments]

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भारतीय मानक

कैसेवा कटाई मशीन — हस्त-चालित — विशिष्टि

Indian Standard

CASSAVA CHIPPING MACHINE — HAND-OPERATED — SPECIFICATION

ICS 67.060

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 2009

Price Group 1

Agriculture and Food Processing Equipments Sectional Committee, FAD 20

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Agriculture and Food Processing Equipments Sectional Committee had been approved by the Food and Agriculture Division Council.

Cassava tubers are highly perishable and cannot be stored for more than a few days after harvest. Hence to avoid heavy post-harvest losses, the tubers are usually converted into sun dried chips. Conventional method of making chips with hand knives is tedious, time consuming and often leads to uneven and delayed drying. The hand-operated cassava chipping machine is easy to operate, can give higher outturn, thus, low operational cost, capability to accommodate all sizes and shapes of tubers and capacity to produce chips of different thickness.

In the formulation of this standard, considerable assistance has been derived from Central Tuber Crops Research Institute, Thiruvananthapuram.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CASSAVA CHIPPING MACHINE — HAND-OPERATED — SPECIFICATION

1 SCOPE

This standard prescribes the material, sizes, performance and other requirements for hand-operated cassava chipping machine.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
210 : 1993	Grey iron castings (*fourth revision*)
2062 : 2006	Hot rolled low, medium and high tensile structural steel (*sixth revision*)
3748 : 1990	Tool and die steels (*second revision*)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Feed Container — The part used for holding the tubers of different shapes and sizes for feeding.

3.2 Cutting Knife — The part having sharp cutting edges to cut the tubers.

3.3 Rotating Disc — The part, which carries the cutting blades and having provisions to let out the chipped pieces.

3.4 Cranking Mechanism — The part, which enables rotation of the disc carrying knives.

3.5 Frame — The part which supports the machine.

3.6 Dimension — Overall size of the machine.

4 MATERIALS

The requirement of the materials used for the different parts of the chipping machine shall be as given in col 3 of Table 1. The material shall conform to the relevant Indian Standards given in col 4 of Table 1.

Table 1 Materials for the Various Parts of the Hand-Operated Cassava Chipping Machine

(*Clause* 4)

Sl No. (1)	Name of Parts (2)	Material Used (3)	Ref to Indian Standard (4)
i)	Feed container	Stainless steel	IS 2062
ii)	Rotating disc	Stainless steel	IS 2062
iii)	Cutting knives	Carbon steel	IS 3748
iv)	Frame leg	Mild steel	IS 2062
v)	Crank handle	Mild steel	IS 2062
vi)	Shafts	Mild steel	IS 2062
vii)	Bearings	Cast iron	IS 210
viii)	Bearing support	Cast iron	IS 2062

5 SIZE

The size of the machine shall be 760 mm × 520 mm × 620 mm.

6 CONSTRUCTIONAL REQUIREMENTS

6.1 Feed Container

Two concentric drum (410 mm and 160 mm each), the annular space between which shall be divided into compartments of varying sizes and shapes for feeding the tubers. The stainless steel drum shall have 230 mm height.

6.2 Cutting Knives

A rotating disc at the bottom of the drum shall carry the blades assembly. The disc shall be 390 mm diameter and 10 mm thick. The blades shall be of carbon steel (110 mm × 25 mm × 5 mm) and three in number, fixed at 120°. There shall be a slot (100 mm × 10 mm) in the disc beneath each blade. thickness of chips can be changed by introducing 'U' type metal washers between the disc and the blade.

6.3 Cranking Mechanism

A pair of bevel gears (high speed steel material) with crank handle suitably fixed on bearings shall be provided to operate the machine manually.

6.4 Frame

The legs of the frame shall be of mild steel angle. The feeder is screwed to the four legs supporting the machine. Bearings for the cranking mechanism is also supported on this legs.

7 PERFORMANCE REQUIREMENTS

Performance of the machine shall be tested for capacity (in kg/h), product uniformity and extent of breakage in accordance with method given in Annex A.

8 WORKMANSHIP AND FINISH

8.1 The workmanship of the chipping machine shall be such that there is no vibration or movement of the machine during operation when placed on the ground.

8.2 All the metallic parts of the machine shall be given an anti-corrosive and rust preventive paint coating including the cutting knives.

9 MARKING AND PACKING

9.1 The hand-operated chipping machine shall be marked on a suitable non-wearing part with the following particulars:

a) Manufacturers name and recognized trade-mark, if any;
b) Size of the machine with capacity; and
c) Batch and code number.

9.2 BIS Certification Marking

The chipping machine may also be marked with the Standard Mark.

9.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*,1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

9.3 Packing

9.3.1 Machine shall be packed for safe handling in transit and storage as specified by the purchaser.

ANNEX A

(*Clause* 7)

METHOD FOR PERFORMANCE TESTS FOR CASSAVA CHIPPING MACHINE — HAND-OPERATED

A-1 CASSAVA TUBERS

Take sufficient quantity (1 kg minimum) of washed and clean cassava tubers of the same variety.

A-2 OPERATION

A-2.1 Intermittent Operation by Single Person

Load the feed container with the tubers with minimum one kg of cassava and crank the handle to perform chipping. Stop after chipping and re-load.

A-2.2 Continuous Operation by Two Persons

One can crank the handle continuously while the other feed the tubers in to the feeder compartment. Stop after some time to remove the fallen chips.

A-3 PERFORMANCE OF THE MACHINE

A-3.1 Capacity

Machine shall be operated for a period of four hours with usual stoppage and the total quantity of chips produced per unit time shall be noted and reported in kilogram per hour. The capacity of the machine shall not be less than the rated capacity of the machine.

A-3.2 Product Uniformity

Fifty chipped samples shall be drawn from the each particle size and thickness shall be measured at four quadrant points near the periphery. The standard error between the chips as well as the coefficient of variation with in the chips shall be determined to serve as an indicator of the product uniformity.

A-3.3 Breakage Analysis

Sufficient quantity (1 kg) of the chipped sample is taken and sorted out into brokens (half chip sizes), fine particles (shapeless tiny bits) and unchipped parts (last pieces of tubers). The percentage of these fractions is calculated and reported. The extent of breakage shall not be more than 3 percent.

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